

WHAT IS CLAIMED IS:

1. A method for negotiation or re-negotiation of a parameter  
or parameters for use in the operation of a protocol that  
5 controls data transmission between first Communication Units  
(CUs) and third CUs via second CUs,

where the protocol is operated by protocol entities in  
the first and third CUs,

where a first CU is always associated with a second CU  
10 at a time,

where a second CU is always associated with a third CU  
at a time, and

where there exist second CUs of at least a first and  
second type and/or third CUs of at least a first and second  
15 type that require different choices of said parameter,

**characterised in that**

when an existing association of said first CU with a  
former second CU is changed to an association of said first  
CU with a new second CU,

20 said protocol entities of the first CU and protocol  
entities of the third CU associated with the new second CU  
exchange at least one negotiation message containing a  
value for said parameter.

25 2. A method according to claim 1,

**characterised in that**

the former second CU was associated with a third CU of  
a first type and the new second CU is associated with a  
third CU of a second type.

30

3. A method according to claim 2,

**characterised in**

that in said exchange of at least one negotiation message, the protocol entity in the first CU performs the following steps:

5 a first step of checking whether said parameter is required for the operation of said protocol between the protocol entities of the first CU and the third CU that is associated to the new second CU,

a second step of checking whether said parameter needs to be negotiated or re-negotiated, and

10 a third step of transmitting a negotiation message containing a value for said parameter to the protocol entity of the third CU associated with the new second CU, if said first and second checking steps produced positive results.

15 4. A method according to claim 3,  
**characterised in**

that in said exchange of at least one negotiation message, the protocol entity of the third CU associated with the new second CU performs the following steps:

20 receiving the negotiation message transmitted by the protocol entity of the first CU containing a value for said parameter, and

transmitting a negotiation message to the protocol entity of the first CU containing the received or a higher  
25 value for said parameter.

5. A method according to claim 1,  
**characterised in**

30 that said first CU is a Mobile Station (MS) of a mobile radio system,

that said second CUs are Base Transceiver Stations (BTSS), and

that said third CUs are Mobile-services Switching  
Centres (MSCs).

6. A method according to claim 5,

5       **characterised in**

that said third CU of the first type is a MSC of a  
mobile network operated according to the UMTS standard or a  
derivative thereof (UMTS-MSC), and

10       that said third CU of the second type is a MSC of a  
mobile network operated according to the GSM standard or a  
derivative thereof (GSM-MSC).

7. A method according to claim 5,

**characterised in**

15       that said protocol is a circuit switched, non-  
transparent single- and/or multi-link data protocol with  
Automatic Repeat Request (ARQ).

8. A method according to claim 7,

20       **characterised in**

that said protocol is the Radio Link Protocol (RLP).

9. A method according to claim 7,

**characterised in**

25       that said parameter defines the value of a re-  
sequencing timer that guards the difference between the  
delays of frames transmitted on different physical links  
within a multi-link protocol.

30   10. A method according to claim 7,

**characterised in**

that said first step of checking whether said  
parameter is required for the operation of said protocol

between the protocol entities of the MS and GSM-MSC  
comprises the step of checking whether the data transmission  
between the MS and the GSM-MSC is a multi-link transmission  
or whether there is a possibility that the single-link  
5 transmission will be upgraded to a multi-link transmission  
later.

11. A method according to claim 10,  
**characterised in**  
10 that said second step of checking whether said  
parameter needs to be negotiated or re-negotiated comprises  
the step of checking whether a value for said re-sequencing  
timer was defined by the user of the MS.

15 12. A method according to claim 1,  
**characterised in that**  
the former second CU is a second CU of a first type and  
the new second CU is a second CU of a second type.

20 13. A method according to claim 12,  
**characterised in**  
that in said exchange of at least one negotiation  
message, the protocol entity of the third CU associated with  
the new second CU performs the step of transmitting a  
25 negotiation message containing a value for said parameter to  
the protocol entity of the first CU.

14. A method according to claim 13,  
**characterised in**  
30 that said value for said parameter depends on the  
transmission characteristic of the transmission medium  
between the new second CU and its associated third CU and

that said value can be determined by said third CU for each of the second CUs it can be associated with.

15. A method according to claim 13,

5       **characterised in**

that in said exchange of at least one negotiation message, the protocol entity of the first CU performs the following steps:

receiving the negotiation message transmitted by the  
10 protocol entity of the third CU that is associated with the new second CU and containing a value for said parameter, and  
transmitting a negotiation message to the protocol entity of the third CU that is associated with the new second CU containing the same or a higher value for said  
15 parameter.

16. A method according to claim 12,

**characterised in**

that said first CU is a Mobile Station (MS) of a mobile  
20 radio system,

that said second CUs are Base Transceiver Stations (BTSS), and

that said third CUs are Mobile-services Switching Centres (MSCs).

25

17. A method according to claim 16,

**characterised in**

that one out of the first and second types of said second CU is a BTS that is connected to its associated MSC  
30 via a lower-delay network, and

that the other type of said second CU is a BTS that is connected to its associated MSC via a higher-delay network.

18. A method according to claim 17,  
    **characterised in**  
    that said lower-delay network is a Time Division  
Multiplex (TDM) network.

5

19. A method according to claim 17,  
    **characterised in**  
    that said higher-delay network is at least partially  
based on the Internet Protocol (IP) or a satellite  
10 connection.

20. A method according to claim 17,  
    **characterised in**  
    that the MSC that is connected to its associated BTS  
15 via a lower-delay network is either operated according to  
the UMTS standard, the GSM standard or a derivative thereof,  
and

    that the MSC that is connected to its associated BTS  
via a higher-delay network is either operated according to  
20 the UMTS standard, the GSM standard or a derivative thereof.

21. A method according to claim 12,  
    **characterised in**  
    that said protocol is a circuit switched, non-  
25 transparent single- and/or multi-link data protocol with  
Automatic Repeat Request (ARQ).

22. A method according to claim 21,  
    **characterised in**  
30 that said protocol is the Radio Link Protocol (RLP).

23. A method according to claim 21,  
    **characterised in**

that said parameter defines the value of an acknowledgement timer that guards the re-transmission period after which the re-transmission of a not-acknowledged frame within a protocol with ARQ may be started.

5

24. A method according to claim 21,

**characterised in**

that said parameter defines the value of a re-sequencing timer that guards the difference between the  
10 delays of frames transmitted on different physical links within a multi-link protocol.

25. A method according to claim 14,

**characterised in**

15 that said transmission characteristic is related to the transmission delay.

26. A method for negotiation of a parameter or parameters for use in the operation of a protocol that controls data  
20 transmission between first Communication Units (CUs) and third CUs via second CUs,

where the protocol is operated by protocol entities in the first and third CUs,

25 where a first CU is always associated with a second CU at a time,

where a second CU is always associated with a third CU at a time, and

where there exist second CUs of at least a first and second type and/or third CUs of at least a first and second  
30 type that require different choices of said parameter,

**characterised in that**

in the case that it is possible that an association of said first CU with a second CU that is associated with a

third CU of a first type may be changed to an association of said first CU with a second CU that is associated with a third CU of a second type,

5       said protocol entities of said first CU and said protocol entities of said third CU of the first type perform the step of exchanging at least one negotiation message containing a value for said parameter prior to said change of associations.

10   27. A method according to claim 26,

**characterised in**

that in said exchange of at least one negotiation message, the protocol entities in the first CU or the third CU of the first type perform the following steps:

15       checking whether it is possible that said data transmission between the first CU and the third CU of the second type is a multi-link data transmission that requires the definition of a re-sequencing timer as said parameter for said protocol, and

20       checking whether a value for said re-sequencing timer is available as a basis for negotiation.

28. A computer program product directly loadable into the internal memory of a digital computer, comprising software code portions for performing the steps of claim 3 when said product is run on a computer.

29. A system for data transmission between first Communication Units (CUs) of said system and third CUs of said system via second CUs of said system,  
30       where the protocol that controls said data transmission is operated by protocol entities in the first and third CUs,



where a first CU is always associated with a second CU  
at a time,

where a second CU is always associated with a third CU  
at a time, and

5       where there exist second CUs of at least a first and  
second type and/or third CUs of at least a first and second  
type that require different choices of at least one  
parameter for use in the operation of said protocol,

**characterised in that**

10       when an existing association of said first CU with a  
former second CU is changed to an association of said first  
CU with a new second CU,

      said protocol entities of the first CU and protocol  
entities of the third CU associated with the new second CU  
15       exchange at least one negotiation message containing a value  
for said parameter.

30. A system for data transmission between first  
Communication Units (CUs) of said system and third CUs of  
20       said system via second CUs of said system,

      where the protocol that controls said data transmission  
is operated by protocol entities in the first and third CUs,

      where a first CU is always associated with a second CU  
at a time,

25       where a second CU is always associated with a third CU  
at a time, and

      where there exist second CUs of at least a first and  
second type and/or third CUs of at least a first and second  
type that require different choices of at least one  
30       parameter for use in the operation of said protocol,

**characterised in that**

      in the case that it is possible that an association of  
said first CU with a second CU that is associated with a

third CU of a first type may be changed to an association of said first CU with a second CU that is associated with a third CU of a second type,

- said protocol entities of said first CU and said
- 5 protocol entities of said third CU of the first type perform the step of exchanging at least one negotiation message containing a value for said parameter prior to said change of associations.